

AMENDMENT TO THE CLAIMS:

Please amend Claims 14, 22, 37 and 56 as follows:

Claims 1-13 (canceled)

Claim 14 (currently amended): An automated package identification and measuring system comprising:

a housing;

a planar laser illumination and imaging (PLIIM) based bar code reading subsystem disposed in said housing, for reading bar codes on packages passing below or near said system so as to identify said packages,

wherein said PLIIM based bar code reading subsystem includes

(i) an image formation and detection module having imaging optics with a field of view (FOV) focused at an image detecting array,

(ii) a planar laser illumination array having a plurality of planar laser illumination modules for producing a plurality of substantially planar laser beam components which are combined to produce a composite substantially planar laser illumination beam having substantially planar spatial distribution characteristics that extend through said field of view so that laser light, reflected off said packages illuminated by said composite substantially planar laser illumination beam, is focused along said field of view and onto said image detecting array to form images of said illuminated packages as said packages move past said PLIIM based bar code reading ~~system~~ subsystem, and

(iii) an image processor for processing said images of said illuminated packages and reading one or more bar code symbols represented in each said image, so as to enable the identification of each illuminated package; and

a package dimensioning subsystem disposed in said housing, for capturing information about the dimensions of said packages prior to being identified by said PLIIM-based bar code reading subsystem.

Claims 15-19 (canceled)

Claim 20 (original): An object attribute acquisition and analysis system comprising:

a first subsystem for acquiring and analyzing, in real-time, the physical attributes of objects selected from the group consisting of (i) the surface reflectivity characteristics of said objects, (ii) geometrical characteristics of said objects, including shape measurement, (iii) the motion (i.e. trajectory) and velocity of said objects, and (iv) bar code symbols, textual materials, and or other information-bearing structures disposed on said objects,

wherein said first subsystem includes

(i) an image formation and detection module having imaging optics with a field of view (FOV) focused at an image detecting array, and

(ii) a planar laser illumination array having a plurality of planar laser illumination modules for producing a plurality of substantially planar laser beam components which are combined to produce a composite substantially planar laser illumination beam having substantially planar spatial distribution characteristics that extend through said field of view so that laser light, reflected off said objects illuminated by said composite substantially planar laser illumination beam, is focused along said field of view and onto said image detecting array to form images of said illuminated objects as said objects move past said first subsystem, and

a second subsystem for processing said images of said illuminated objects and reading one or more bar code symbols, textual material, or other information-bearing structures represented by each said image, so as to enable the identification of each illuminated object, for use in diverse applications including object identification, tracking, and/or transportation/routing operations.

Claim 21 (canceled)

Claim 22 (currently amended): An object attribute acquisition and analysis system comprising:

a planar laser illumination and imaging (PLIIM) based subsystem, including

(i) auto-focus/auto-zoom imaging optics with a variable field of view (FOV) focused at an image detecting array having height/velocity-driven photo-integration time control for capturing images of objects so that said captured images have constant image resolution (i.e. constant dpi) independent of the height of said objects; and

(ii) a planar laser illumination array having a plurality of planar laser illumination modules for producing a plurality of substantially planar laser beam components which are combined to produce a composite substantially planar laser illumination beam having substantially planar spatial distribution characteristics that extend through said field of view so that laser light, reflected off said objects illuminated by said composite substantially planar laser illumination beam, is focused along said field of view and onto said image detecting array to form images of said illuminated objects as said objects move past said object attribute acquisition and analysis system; and

(iii) an image processor for processing said images of said illuminated objects and reading one or more bar code symbols represented in each said image, so as to enable the identification of each illuminated object.

Claims 23-36 (canceled)

Claim 37 (currently amended): A planar laser illumination and imaging (PLIIM) based system comprising:

a planar laser illumination array (PLIA); and

an electronic image detection array which cooperates with said PLIA so as to effectively reduce speckle-pattern noise observed at said electronic image detection array by reducing or destroying either (i) the spatial and/or temporal coherence of planar laser illumination beams (PLIBs) produced by said PLIAs and directed ~~into~~ onto a target, or (ii) the spatial and/or temporal coherence of the planar laser illumination beams (PLIBs) that are reflected/scattered off said target and received by said an image formation and detection (IFD) subsystem employed in said PLIIM based system.

Claims 38-55 (canceled)

Claim 56 (currently amended): A unitary planar laser illumination and imaging (PLIIM) based package dimensioning and identification system comprising:

a Laser Doppler Imaging and Profiling (LDIP) subsystem for generating package dimension related information signals;

a camera control computer responsive to said package dimension related information signals, for generating digital control signals; and

an image formation and detection (IFD) subsystem responsive to said digital control signals, so that said PLIIM based package dimensioning and identification system can carry out its diverse functions in an integrated manner, wherein said diverse functions are selected from the group consisting of

- (1) capturing digital images having (i) square pixels (i.e. 1:1 aspect ratio) independent of package height or velocity, (ii) significantly reduced speckle-noise levels, and (iii) constant image resolution measured in dots per inch (dpi) independent of package height or velocity,
- (2) automatic cropping of captured images so that only regions of interest ~~reflecting~~ representing the package or package label require image processing by ~~the~~ an image processing computer, and
- (3) automatic image lifting operations.

Claims 57-94 (canceled)

Claim 95 (previously presented): The automated package identification and measuring system of claim 14, wherein each said planar laser illumination module comprises a visible laser diode (VLD), a focusing lens, and a cylindrical optical element arranged therewith to produce one of said plurality of substantially planar laser illumination beam components.

Claim 96 (previously presented): The object attribute acquisition and analysis system of claim 20, wherein each said planar laser illumination module comprises a visible laser diode (VLD), a focusing lens, and a cylindrical optical element arranged therewith to produce one of said plurality of substantially planar laser illumination beam components.

Claim 97 (previously presented): The object attribute acquisition and analysis system of claim 22, wherein each said planar laser illumination module comprises a visible laser diode (VLD), a focusing lens, and a cylindrical optical element arranged therewith to produce one of said plurality of substantially planar laser illumination beam components.